

Claims

What is claimed is:

- 5 1. A multiple wavelength laser source comprising:

a loop mirror, said loop mirror means comprising

a loop of active fiber and a first coupler having four ports, the fiber loop being connected to a first and second port of the first coupler;

10 at least one pump means for injecting pump energy into the loop of active fiber; and

a plurality of wavelength-selective reflection devices, said devices having different selected wavelengths and coupled to at least a third port of the first coupler;

15 each reflection device for reflecting into the fiber loop a first portion, having a selected wavelength, of amplified spontaneous emission produced by the loop of active fiber, and directing a second portion of the amplified spontaneous emission to an output port.

- 20 2. A laser source as defined in claim 1, wherein the plurality of reflection devices is in series between the first coupler and the output port.

3. A laser source as defined in claim 1, further comprising an attenuator between the plurality of reflection devices and the third port of the first coupler for adjusting
25 amplitude of light at a selected wavelength.

4. A laser source as defined in claim 1, wherein the first coupler is a 3-dB coupler.

5. A laser source as defined in claim 1, wherein another plurality of reflection devices is
30 connected between a fourth port of the first coupler and another output port.

6. A laser source as defined in claim 1, wherein the plurality of reflection devices is connected in parallel.

7. The laser source of claim 6 wherein at least one additional coupler is disposed between the first coupler and at least one output port wherein each reflection device is disposed between the at least one additional coupler and the at least one output port.

8. A laser source according to claim 1 wherein the plurality of reflection devices comprises first and second reflection devices connected between first and second ports of a second coupler and first and second output ports of the laser source, respectively, a third port of the second coupler being connected to the third port of the first coupler.

9. A laser source according to claim 8 wherein a fourth port of the second coupler is connected to a third output port of the laser source.

10. A laser source according to claim 8, comprising third and fourth reflection devices connected between first and second ports of a third coupler and third and fourth output ports, respectively, of the laser source, a third port of the third coupler being connected to the fourth port of the first coupler.

11. The laser source of claim 1 further comprising an adjustable attenuator associated with each reflection device for adjusting amplitude of light reflected or transmitted by the reflection device.

12. A laser source system for producing multiple sets of lasing wavelengths, said system comprising:

laser source combining means for combining output from a plurality of multiple wavelength laser sources, each multiple wavelength laser source comprising:

a loop mirror means, said loop mirror means comprising:

a loop of active fiber; and

a coupler which is coupled, via a first and a second port, to both ends of the loop of active fiber;

at least one pump means for injecting pump energy into the loop of active fiber; and

plurality of wavelength-selective reflection devices, said devices having different selected wavelengths and coupled to at least a third port of the coupler;

wherein each reflection device is for reflecting a first portion of amplified spontaneous emission produced by the loop of active fiber, and directing a second portion of the amplified spontaneous emission produced by the loop of active fiber, to an output port.

13. A laser source as defined in claim 1 wherein the reflection devices are fiber Bragg gratings.

14. A laser source according to claim 1 wherein the reflection devices are tunable filters with partially reflective mirrors.